NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

RESIDUE MANAGEMENT, NO TILL/STRIP TILL

(Acre)

Code 329A

DEFINITION

Managing the amount, orientation and distribution of crop and other plant residues on the soil surface year-round, while growing crops planted in narrow slots, or tilled residue free strips previously untilled by full-width inversion implements.

PURPOSES

Conservation practice (329A) may be applied as part of a conservation management system to support one or more of the following:

- Reduce sheet and rill erosion.
- Reduce wind erosion.
- Maintain or improve soil organic matter content and tilth.
- Conserve soil moisture.
- Manage snow to increase plant available moisture or reduce plant damage from freezing or desiccation.
- Provide food and escape cover for wildlife.

CONDITIONS WHERE PRACTICE APPLIES

Applies to all cropland and other land where crops are grown.

Includes tillage and planting methods commonly referred to as no till, zero till, slot plant, row till, zone till, direct seeding, or strip till.

CRITERIA

General Criteria Applicable to All Purposes Named Above

Loose residues to be retained on the field, shall be uniformly distributed on the soil surface to minimize variability in planting depth, seed germination, and emergence of subsequently planted crops. Where combines or similar machines are used for harvesting, they shall be equipped with spreaders capable of distributing residue over at least 80 percent of the working width of the header.

Planters or drills shall be equipped to plant directly through untilled residue or in a tilled seedbed prepared in a narrow strip in each row by planter attachments such as rotary tillers, sweeps, multiple coulters, or row cleaning devices. Seedbed preparation, planting, and fertilizer placement shall disturb no more than one third of the row width. The row area formed by the planting operation shall be level with or slightly above the adjacent row middles unless the rows are planted on the contour.

Residues shall not be burned, or disturbed by full-width tillage operations except as follows:

If row cultivation or spot treatment for weed escapes, leveling ruts, or similar operations become necessary, the tillage implement used shall be fitted with sweep blades or similar attachments designed for shallow undercutting type action in order to minimize burial of surface residue.

Additional Criteria to Reduce Sheet and Rill Erosion

The amount of flat , randomly distributed residue needed to reduce erosion to the soil loss tolerance level (T) or any other planned soil loss objective, shall be determined using the Revised Universal Soil Loss Equation

described in USDA Agriculture

Handbook Number 703, "Predicting Soil Erosion by Water: A Guide to Conservation Planning with the Revised Universal Soil Loss Equation. " Partial removal of residue by baling, grazing, or other means shall be limited to retain adequate residue for the planned level of erosion control. Calculations shall account for the effects of other practices in the conservation management system using the procedure described in Agronomy Technical Note IL-17 (Most Recent Revision), or similar references.

Additional Criteria to Reduce Wind Erosion

The amount and orientation of residue needed to reduce erosion to the soil loss tolerance (T) or other planned soil loss objective shall be determined using current approved wind erosion prediction technology. Partial removal of residue by baling, grazing or other means shall be limited to retain the amount needed.

Calculations shall account for the effects of other practices in the conservation management system.

Additional Criteria to Maintain or Improve Soil Organic Matter Content

The amount of residue needed to achieve the desired soil condition, shall be determined using the current approved soil conditioning index procedure. Partial removal of residue by means such as baling or grazing shall be limited to retain the amount needed. Calculations shall account for the effects of other practices in the conservation management system.

Additional Criteria to Conserve Soil Moisture

A minimum quantity of 50 percent residue cover shall be maintained throughout the year. Residue shall be evenly distributed and maintained on the soil surface. Partial removal of residue by means such as baling or grazing shall be limited to retain the amount needed.

Additional Criteria to Manage Snow to Increase Plant Available Moisture or Reduce Plant Damage From Freezing or Desiccation

Stubble shall be left standing as high as possible by the harvesting operation. The minimum stubble height remaining shall be 6 inches. Stubble shall remain standing over winter to trap and retain snow. Loose residue may be removed if the remaining residue is left standing.

When crops are planted in the fall, the width of the tilled strip or slot shall be no more than one third of the row width, in order to reduce the disturbance of standing stubble.

Additional Criteria to Provide Food and Escape Cover for Wildlife

Residue height, amount, and time period shall be determined using an approved habitat evaluation procedure. Residues shall not be removed unless determined by the habitat evaluation procedure that removal would not adversely affect habitat values.

CONSIDERATIONS

No till or strip till may be practiced continuously throughout the crop sequence, or may be managed as part of a system which includes other tillage and planting methods such as mulch till.

Production of adequate amounts of crop residues necessary for the proper functioning of Conservation Practice (329A) can be enhanced by selection of high residue producing crops and crop varieties in the rotation, use of cover crops, and adjustment of plant populations and row spacings. When using cover crops to achieve the purposes of this practice, see "Cover and Green Manure Crop" practice standards and specifications, Practice Code IL-340.

Maintaining a continuous no till system will maximize the improvement of soil organic matter content. Also, when no till is practiced continuously, soil reconsolidation provides additional resistance to sheet and rill erosion.

The effectiveness of stubble to trap snow or reduce plant damage from freezing or desiccation increases with stubble height. Variable height stubble patterns may be created to further increase snow storage.

Leaving rows of unharvested crop standing at intervals across the field can enhance the value of residues for wildlife habitat.

PLANS AND SPECIFICATIONS

Specifications for establishment and operation of Conservation Practice (329A) shall be prepared for each field or conservation treatment unit according to the Criteria, Considerations, and Operation and Maintenance described. Specifications shall be

recorded using approved job sheets, narrative statements in the conservation plan, or other acceptable documentation.

OPERATION AND MAINTENANCE

No operation and maintenance requirements have been identified for this practice.

REFERENCES

Midwest Plan Service, Conservation Tillage Systems and Management, MWPS-45, First Edition, 1992.

Moldenauer, W.C. and Mielke, L.N., Crop Residue Management to Reduce Erosion and Improve Soil Quality, North Central, Conservation Report Number 42, (United States Department of Agriculture, Agricultural research Service, November 1995).

USDA Natural Resources Conservation Service, Crop Residues and Management, Technical Note-Agronomy IL-17 (Rev. 3), August 1999.